202401UECM3473OE5B

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Review of preview

Started on	Sunday, 7 April 2024, 12:37 PM
Completed on	Sunday, 7 April 2024, 12:37 PM
Time taken	8 secs
Marks	0/8
Grade	**0** out of a maximum of 10 (**0**%)

1

Marks: 1

The following data are available for a group policyholder:

.	Year 1	Year 2	Year 3
Total claims	21030	33810	--
Number in groups	75	110	130

The manual rate per exposure is 480 per year. Estimate the total credibility premium for year 3 using empirical Bayes non-parametric methods. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 38660.328513
Marks for this submission: 0/1.

2

Marks: 1

Health insurance is sold to 500 individuals. The following table summarizes the number of claims submitted by these individuals is a year.

Number of Claims	Number of Policyhoders
0	365
1	105
2	25
3	5
4 or more	0

Credibility is calculated using empirical Bayes semiparametric methods. annual claim counts for each individual are assumed to follow a Poisson distribution. Determine the estimate of the number of claims submitted in the next year by someone who submitted 2 claims in the current year. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.5347
Marks for this submission: 0/1.

3
Marks: 1

The following information comes from a study of robberies of convenience stores over the course of a year:

- X_i is the number of robberies of the ith store, with i = 1, 2, ..., 480.
- $\sum X_i = 80$
- $\sum X_i^2 = 210$
- The number of robberies of a given store during the year is assumed to be Poisson distributed with an unknown mean that varies by store.

Determine the semiparametric empirical Bayes estimate of the expected number of robberies next year of a store that reported 3 robberies during the studied year. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 1.849859
Marks for this submission: 0/1.

4
Marks: 1

- During a single 6-years period, 100 policies had the following total claims experience:

Number of Claims in Year 1 thtough Year 6	Number of Policies
0	38
1	36
2	17
3	6
4	3

- The number of claims per year follows a Poisson distribution.
- Each policyholder was insured for the entire period.

A randomly selected policyholder had 1 claims over the period. Using the semiparametric emprical Bayes estimation, determine the Buhlmann estimate for the number of claims in Year 7 for the same policyholder. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.166667
Marks for this submission: 0/1.

5
Marks: 1

For a large sample of insureds, the observed relative frequency of claims during an observation period is as follows:

Number of Claims	Relative Frequency of Claims
0	61.94 %
1	27.57 %
2	7.57 %
3	1.62 %
4	1.30 %
5+	0

Assume that for a randomly chosen insured, the underlying conditional distribution of number of claims per period given the parameter Θ is Poisson with parameter Θ. Given and individual who had c claims in the observation period. The semi empirical Bayesian estimate of the expected number of claims that the individual will have in the next period is 1.390825. Determine c. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 5
Marks for this submission: 0/1.

6 Marks: 1

The number of claims submited by seven policyholders over three months is shown in the following table:

	January	February	March
A	2	1	2
B	1	1	0
C	1	1	1
D	3	3	3
E	1	1	3
F	0	2	2
G	2	0	2

The number of claims for the following year is estimated using empirical Bayes semiparametric methods. It is assumed that each policyholder's annual claims follow a Poisson distribution. Unbiased estimators are used for the expected value of the process variance and the variance of hypothetical means. Calculate the credibility projection of the annual number of claims for policyholder A. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 18.417437
Marks for this submission: 0/1.

7 Marks: 1

You are given the followings:

- The number of losses arising from m + 46 individual insureds over a single period of observation is distributed as follows:

Number of Losses	Number of Insureds
0	m
1	35
2	11
3 or more	0

- The number of losses for each insured follows a Poisson distribution, but the mean of each such distribution may be different for individual insureds.
- The variance of the hypothetical means is to be estimated from the data.

Determine the smallest value of m(can be non integer) for which the estimate of the variance of the hypothetical means will be greater than 0. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 99.1
Marks for this submission: 0/1.

8 Marks: 1

For a group of auto policyholders, you are given:

- The number of claims for each policyholder has a conditional Geometric distribution.

- During Year 1, the following data are observed:

Number of Claims	number of Policyhoders
0	15300
1	3000
2	1480
3	200
4	95
5+	0

A randomly selected policyholder had 3 claims in Year 1. Determine the semiparametric empirical Bayes estimate of the number of claims in Year 2 for the same policyholder. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.4134
Marks for this submission: 0/1.

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